MCF 3M Day 3

A textbook costs $50.00. The number of students who need one is represented by x. The total cost of purchasing the books for a class is represented as a function f(x).

a) Write an equation in function notation to represent the cost of purchasing the books
b) State the degree
c) Use the equation to calculate the cost of purchasing 26 books
d) What is the domain and range of this function?

Feb 9-7:59 AM

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a) Write an equation in function notation to represent the cost of purchasing the books
b) State the degree
c) Use the equation to calculate the cost of purchasing 26 books
d) What is the domain and range of this function?

$f(x) = 50x$

$f(26) = 50(26)$

$f(26) = 1300$

$D = \{x \in \mathbb{W} \mid 1 \le x \le 26\}$

$R = \{f(x) \in \mathbb{R} \mid 50 \le f(x) \le 1300\}$

Feb 9-7:59 AM

Working with Function Notation

Sec 1.3 p. 27

Substitution

I) $h(t) = y$

$h(t)$ - function notation
- used to represent the dep variable for a given value of the ind variable

clep

$h(t)$ = height in m

Rocket

$h(4) = -4.9(4)^2 + 19.6(4) + 34.3$

$h(0) = -4.9(0)^2 + 19.6(0) + 34.3$

$h(0) = 34.3\text{m}$

at t=0 the rocket is already 34.3m high

The height of the building is 34. 3 m high.

Feb 9-10:20 AM

LEARN ABOUT the Math

A rocket is shot into the air from the top of a building. Its height, in metres, after t seconds is modelled by the function $h(t) = -4.9t^2 + 19.6t + 34.3$.

What is the meaning of $h(t)$ and how does it change for different values of t?

Use function notation and a table of values to show the height of the rocket above the ground during its flight.

Leila's Solution: Using a Table of Values

t	0	1	2	3	4	5	6
$h(t)$	34.3	49.0	53.9	49.0	34.3	9.8	−24.5

Feb 9-7:47 AM

5 sec

$t = 5$

$h(5) = -4.9(5)^2 + 19.6(5) + 34.3$

$h(5) = -4.9(25) + 98 + 34.3$

$h(5) = -122.5 + 132.3$

$h(5) = 9.8\text{m}$

$h(6) = -4.9(6)^2 + 19.6(6) + 34.3$

$h(6) = -24.5$

Somewhere between 5 and 6 sec the rocket hits the ground

by sub the rocket hits the ground after 5.3 s

$h(5.3) = 0$

Feb 9-10:29 AM

I) Substitution of Special Functions

p30

$f(x) = 2x^2 + 3x - 1$

i) $f(5) - f(4)$

$f(5) - f(4) = [(2(5)^2 + 3(5) - 1) - (2(4)^2 + 3(4) - 1)]$

$= [2(25) + 15 - 1 - (2(16) + 12 - 1)]$

$= [50 + 15 - 1] - [32 + 12 - 1]$

$= 65 - 1 - (44 - 1)$

$= 64 - 43$

$= 21$

$f(5) - f(4)$

Feb 9-10:39 AM

EXAMPLE 3 Representing and comparing the value of a function

The relationship between the selling price of a new brand of sunglasses and revenue, $R(s)$, is represented by the function $R(s) = -10s^2 + 800s + 120$ and its graph at the left.

a) Determine the revenue when the selling price is $5.
b) Explain what $R(20) = 12\,120$ means.
c) If $R(s) = 16\,120$, determine the selling price, s.

Feb 9-7:53 AM

iii $R(s) = -10s^2 + 800s + 120$ p30 Ex 3

$R(5) = -10(5)^2 + 800(5) + 120$

$R(5) = -250 + 4000 + 120$

$R(5) = 4120 - 250$

$R(5) = 3870$

When the company charges $5 they will generate $3870 in revenue

Feb 9-10:49 AM

ii $R(20) = 12\,120$

when the company charges $20 per pair of sunglasses then generate $12 120.00 in revenue

iii) $R(s) = 16\,120$

$16120 = -10s^2 + 800s + 120$

$0 = -10s^2 + 800s + 120 - 16120$

$0 = -10s^2 + 800s - 16000$

$0 = -10(s^2 - 80s + 1600)$

off graph $R(40) = 16\,120$

At a selling price of $40 per pair of sunglasses you generate $16 120.

Feb 9-10:52 AM

Common Factor

$\frac{0}{-10} = \frac{-10s^2 + 800s - 16000}{-10}$

$0 = s^2 - 80s + 1600$

$0 = (s-40)(s-40)$

∴ selling price is 40

A	M
-80	1600
-40	-40

p 32-35

q 3,4,5, l0 i) ii) ,12,&16

Feb 9-10:59 AM

$f(x) = -3x^2 + 5$ $f(2x)$

$f(2x) = -3(2x)^2 + 5$

$f(2x) = -3(4x^2) + 5$

$f(2x) = -12x^2 + 5$

Feb 9-11:07 AM